

In the Specification:

On page 1, rewrite lines 1-3 as follows:

Device for monitoring tool wear and/or breakage for a machine tool

BACKGROUND OF THE INVENTION

On page 2, rewrite lines 18-34 as follows:

For example, in the embodiment illustrated in figure 1, the motor (M) is connected to the three-phase network (R) by way of a module (A) exhibiting, in a manner perfectly well known to the person skilled in the art, any control system such as a variable-speed drive, frequency converter, etc. This control module is itself subject to a digital command module (B) or other command facility such as an automatic controller via an analogue link or a digital bus (a). At the output of the module (A), the three phases of the network are connected to a system (~~CA~~), sensor (CA) of electrical measurements (power, current, etc.). The electrical measurements sensor (CA), via an analog link or a digital bus (b), is linked to the tool wear and breakage monitoring device as such (D). The module (D) is linked to the command module (B) by a wire link or a fieldbus (c)

On page 3, rewrite lines 4-13 as follows:

Patent EP 0969340 proposes that the detection of the critical state of a tool be carried out without any learning curve or calibration curve being necessary for operation. For this purpose, the difference is measured between the mean of the current calculated over the last few instants (dynamic preset value) and the instantaneous value of the current. This difference thus established is then compared with a fixed value (present value) to detect the critical state.

BRIEF SUMMARY OF THE INVENTION

On page 5, rewrite lines 1-6 as follows:

- or the command module, the control system for the tool drive motor and the module for electrical measurement and for monitoring the tool wear and breakage are integrated into one and the same assembly.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

On page 5, rewrite lines 26-31 as follows:

As shown in figure 1, the device according to the invention comprises a module (A) constituting the control system for the motor (M), integrating for example a variable-speed drive, a frequency converter, etc. The motor (M) constitutes for example the drive motor for a machine tool spindle.

On page 5, rewrite lines 16-25 as follows:

- figure 3 is a schematic showing the command, the monitoring and the measurement of certain electrical quantities of a motor according to a characteristic underlying the device of the invention[.];
- figure 4 shows more particularly the single module suitable for detecting the wear and/or the breakage of tools of a machine tool spindle for example[.];
- figure 5 illustrates integration into one assembly of the motor control module and the electrical parameter measurement and digital monitoring module;
- figure 6 illustrates a single assembly integrating the command module and the electrical parameter measurement and digital monitoring module; and
- figure 7 illustrates an assembly integrating the command module, motor control module and the electrical parameter measurement and digital monitoring module.

On page 6, rewrite lines 11-12 to read as follows:

The module (E) is linked to the command module (B) by a fieldbus or a wire link (c) over which on/off digital information for stopping the machine tool in the event of tool wear and/or breakage (g) may be transmitted as illustrated in figure 4.

DETAILED DESCRIPTION

On page 6, rewrite lines 19-26 as follows:

In view of this integration, it has been necessary to solve the problem of how to prevent the presence of the three-phase power signals for controlling the motor from disturbing the

monitoring function. For this purpose, the system (CA) suitable for performing the measurements and for digitizing them has been designed in two parts (CA1) and (CA2) mutually galvanically isolated ~~(g)~~ (f).